REDUCTION OF OIL ADSORPTION IN BANANA FRITTER BALLS: THE EFFECT OF HYDROCOLLOID SUBSTITUTION

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by

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Sekian, terima kasih.

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DECLARATION BY AUTHOR

This dissertation is composed of my original work and contains material previously published or written by another person except where due reference has been made in the text. The content of my dissertation is the result of work I have carried out since the commencement of my research project and does not include a substantial part of work that have been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution.

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LIST OF SYMBOLS

%	Percentage
^{o}C	Degree Celsius
h	Hour
min	Minute
s	Second
cm	Centimeter
mm	Millimeter
mL	Milliliter
Kg	Kilogram
g	Gram

LIST OF ABBREVIATIONS

CMC	Carboxylmetyl cellulose
ANOVA	Analysis of Variance
TAG	Triglycerides
SPSS	Statistical Package for the Social Sciences

PENGURANGAN PENYERAPAN MINYAK DALAM CEKODOK PISANG: KESAN PENGGANTIAN HIDROKOLOID

ABSTRAK

Sifat fizikokimia cekodok pisang dan minyak gorengan dengan penggantian hidrokoloid iaitu kanji jagung yang diubahsuai, karboksilmetil selulosa (CMC) dan gam gellan, dalam tepung gandum telah dikaji. Adunan 100% tepung gandum digunakan sebagai sampel kawalan. Penggantian hidrokoloid dalam tepung gandum dibuat dengan pencampuran kering kedua-dua bahan pada kadar 4%, 6%, 8%, 10% dan 12%. Adunan disediakan dengan mencampurkan hidrokoloid dan tepung gandum, pisang, gula, garam dan seterusnya digoreng di dalam minyak gorengan pada 180°C selama 4-5min. Kemudian, sampel dianalisis untuk pengambilan minyak, nisbah pengambilan minyak, tekstur dan asid lemak bebas. Pengambilan minyak cekodok pisang berkurangan dengan bertambahnya kadar hidrokoloid. Perkadaran 12% CMC menunjukkan pengambilan minyak paling rendah. Walau bagaimanapun, tidak ada perbezaan yang signifikan antara 12% kanji jagung yang diubahsuai, CMC dan gam gellan pada pengambilan minyak. Nisbah pengambilan menurun dengan meningkatnya jumlah hidrokoloid. Perkadaran 12% CMC menunjukkan nisbah pengambilan minyak terendah. Walau bagaimanapun, tidak ada perbezaan yang signifikan antara 12% kanji jagung yang diubahsuai, CMC dan gam gellan pada nisbah pengambilan. Untuk analisis tekstur, cekodok pisang dengan 12% CMC menunjukkan kekerasan tertinggi, sementara 12% gam gellan menunjukkan daya tahan tertinggi. Sebaliknya, 12% gam gellan menunjukkan kekompakan tertinggi dan sampel kawalan menunjukkan kekenyalan tertinggi. Analisis nilai asid lemak bebas untuk minyak gorengan dilakukan untuk menentukan kualiti minyak. Asid lemak bebas dari cekodok pisang menggunakan 12% CMC menunjukkan asid lemak bebas terendah. Secara

keseluruhan, kajian menyimpulkan bahawa penggantian hidrokoloid meningkatkan sifat fizikokimia cekodok pisang berbanding 100% tepung gandum. Kualiti minyak gorengan setelah menggoreng cekodok pisang dengan penggantian hidrokoloid juga memberikan kualiti minyak goreng yang lebih baik berbanding dengan cekodok yang 100% tepung gandum.

REDUCTION OF OIL ADSORPTION IN BANANA FRITTER BALLS: THE EFFECT OF HYDROCOLLOID SUBSTITUTION

ABSTRACT

The physicochemical properties of banana fritter balls and frying oil quality with substitution of hydrocolloids namely, modified corn starch, carboxylmethyl cellulose (CMC) and gellan gum, in wheat flour were studied. Batter of 100% wheat flour is used as the control samples. Hydrocolloids substitution in wheat flour were prepared by dry mixing of both ingredients at the proportion of 4%, 6%, 8%, 10% and 12%. The batter was prepared by mixing proportion of hydrocolloids with wheat flour, banana, sugar, salt and later fried in heated frying oil at 180°C for 4-5min. Later, the fried samples were analysed for oil content, oil uptake ratio, texture and free fatty acids. The oil content of banana fritter balls decreased significantly with increasing the proportion of hydrocolloids. Proportion of 12% CMC showed the lowest oil content. However, there are no significant difference between 12% modified corn starch, CMC and gellan gum on oil uptake. The oil uptake ratio decreased with increasing the proportions of hydrocolloids. Proportion of 12% CMC showed the lowest oil uptake ratio. However, there are no significant difference between 12% modified corn starch, CMC and gellan gum on oil uptake ratio. For textural analysis banana fritter balls of 12% CMC showed the highest hardness, while 12% of gellan gum showed the highest springiness. On the other hand, 12% gellan gum showed the highest cohesiveness and control samples showed the highest chewiness. Free fatty acids analysis of frying oil was conducted to determine the oil quality. The free fatty acids of frying oil to fry banana fritter balls of 12 % CMC showed the lowest free fatty acids. Overall, the study concluded that substitution of hydrocolloids improves the physicochemical properties of banana fritter balls compared to banana fritter balls made of 100% of wheat flour.

The oil quality of frying oil after frying of banana fritter balls with substitution of hydrocolloids also give a better quality of frying oil compare to 100% wheat flour.